M/023/003

BRUSHWELLMAN
ENGINEERED MATERIALS

Brush Wellman Inc.
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Salt Lake City, UT 84115
Phone 801/467-5441

July 29, 1988

Mr. Lowell P. Braxton
Administrator, Mined Land Reclamation Program
Utah Division of Oil Gas and Mining
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203

Re: Topaz Mining Property
ACT/023/003
Juab County, Utah

Dear Mr. Lowell Braxton:

Enclosed please find Brush Wellman's reclamation bonding proposal for the Topaz Mining Property. This bonding proposal is based upon a suggestion by Division staff that, as alternative to the formerly proposed phase bonding, steady-state bonding be considered. In response to this suggestion, a steady-state bonding estimate has been prepared. In order to do so, it was necessary to revise the reclamation schedule so that the planned reclamation work more closely reflected steady state conditions. This was accomplished by changing the proposed timing for topsoil application and the geometry of dump construction so that topsoil will be applied to surfaces to be reclaimed in the year following its removal and storage in a stockpile. Dumps to be stockpiled will be constructed in stages such that the dump area to be disturbed at any one time is proportional to the disturbance created by the action that results in the salvaging of the topsoil. In addition to establishing more-or-less steady state conditions, this change will substantially reduce the period during which the topsoil will be stockpiled and will also reduce the area disturbed by dump construction to that necessary for waste rock disposal for each stage of pit development.

The steady-state bond estimate was created by determining the year in which individual reclamation liabilities are anticipated to be incurred, the years in which reclamation liability would be released, and then the cumulative reclamation liability for each year. The specific reclamation tasks, estimated cost, the anticipated year of incurrence of reclamation bond liability for each task, and the anticipated release date for each task are shown on the attached table entitled "Projected Liability Incurrence and Release Dates". The table entitled "Cululative Reclamation Liability" presents, for each year in which reclamation activities will take place, the total liability incurred, the amount of liability to be released, total liability for each year, and the cumulative reclamation liability for each year. A bar graph depicting cumulative reclamation liability is also attached.

The specific assumptions made in determining the year in which reclamation liability is incurred are:

1) reclamation liability is incurred when a pit is opened or when a disturbance related to other mining activities is initiated; and

2) current liabilities are assumed to include all existing disturbances to be reclaimed.

Assumptions made in the projection of the year in which reclamation liability would be released are as follows:

1) topsoil application is initiated and completed in the year following pit opening and/or stockpiling of the topsoil, and liability for topsoiling is released in that year;

2) revegetation is to be completed in the year in which topsoil is applied and liability released three years thereafter;

3) other reclamation liabilities are released in the year they are scheduled in the reclamation plan.

Brush Wellman proposes that an initial reclamation bond period of either 10 or 15 years be established. During the first 10 to 15 years, the maximum cumulative reclamation liability is $154,800, incurred in 1998. We propose that this amount plus 10 percent for supervision, or $170,300, be the base bond amount for the initial bond term. We further propose that the base amount for each subsequent bonding period be the maximum cumulative liability projected for that period. We understand that DOGM will add both a 10 percent contingency factor and the calculated escalation factor for the agreed-upon bond period to the bond amount.

In addition to the attachments described above, we have also attached revised bonding cost estimate spreadsheets which reflect the change in operator efficiency to 75 percent, or that of an average operator, as requested by DOGM staff.

We appreciate very much the cooperation of your staff during our July 12 visit to the mine. We believe that the bonding proposal presented herein fully addresses their concerns expressed to date. We look forward to successfully working with you and your staff to complete the establishment of surety for the Topaz Mining Property.

Brush Wellman Inc.

Kenneth R. Poulson
Vice President
Mining & Exploration

KRP/ks
Attachments (4)
cc: Frank J. Filas
Reclamation Engineer DOGM

JBR - Consultants

CUMULATIVE RECLAMATION LIABILITY

Year	Increased Liability	Released Liability	Year Total	Cumulative Total
1988	130,600		130,600	130,600
1989		20,400	-20,400	110,200
1990		3,000	- 3,000	107,200
1992		37,600	-37,600	69,600
1993	80,200	2,300	+77,900	147,500
1994	8,800	67,000	-58,200	89,300
1995		5,000	- 5,000	84,300
1997	200	13,200	-13,000	71,300
1998	88,500	5,000	+83,500	154,800
1999		74,100	-74,100	80,700
2001	80,200	9,500	+70,700	151,400
2002		81,300	-81,300	70,100
2004	45,700	4,200	+41,500	111,600
2005	88,400	42,200	+46,200	157,800
2006		74,200	-74,200	83,600
2008	38,600	31,000	+ 7,600	91,200
2009	88,500	43,500	+45,000	136,200
2010		74,900	-74,900	61,300
2011		8,700	- 8,700	52,600
2012	9,500	9,800	- 300	52,300
2013	100	15,200	-15,100	37,200
2014		2,900	- 2,900	34,300
2016	80,200		+80,200	114,500
2017	200	74,900	-74,700	39,800
2018		1,600	- 1,600	38,200
2019		5,800	- 5,800	32,400
2020	77,900	16,900	+61,000	93,400
2021		64,200	-64,200	29,200
2022		3,500	- 3,500	25,700
2024	91,600	14,700	+76,900	102,600
2025		72,700	-72,700	29,900
2028		18,900	-18,900	11,000
2030	100		+ 100	11,100
2031		100	- 100	11,000
2037		11,000	-11,000	- 0 -
TOTAL	909,300	909,300		

Projected Liability Incurrence and Release Dates

Year Incurred	Site	Task	Cost	Anticipated Year Of Release
*	Taurus	Rip Dump Top	6,700	(1)
		Reveg Dump	4,000	(1)
		Rip Roads	700	1990
		Reveg Roads	800	
	Taurus Pit	Construction Pit Berm	200	1990
	Sigma Emma	Construct Dump Berm	300	(1)
		Reveg Dump Perimeter Berm	300	(1)
		Rip Dump Top	2,700	(1)
		Rip Roads	1,400	1990
		Reveg Roads	1,500	1993
	Sigma Emma Pit	Construction Pit Berm	600	1990
	Blue Chalk South	Rip Dump Top	9,700	1989
		Reveg Dump	8,300	1992
		Rip Roads	1,400	2018
		Reveg Roads	1,000	2021
	Blue Chalk S #1 Pit	Cover Tuff Disposal Cell	4,800	1998
		Reveg Backfilled Pit	3,600	2001
	Blue Chalk North Dump	Rip Dump Top	4,900	1989
		Reveg Dump	3,000	1992
	Roadside I&II Dump	Construct Dump Berm	900	(1)
		Reveg Dump Perimeter Berm	900	(1)
		Rip Dump Top	22,800	1992
		Reveg Dump	4,800	1995
	Roadside/Fluro #3	Construct Pit Berm	100	1990
	Roadside/Fluro	Rip Roads	700	2010
		Reveg Roads	700	2013
	Rainbow	Rip 1/2 Dump Top	5,800	1989
		Reveg 1/2 Dump	3,500	1992
		Rip Roads	2,800	2014
		Reveg Roads	3,000	2017
	Rainbow #1 Pit	Cover Tuff Disposal Cell	5,900	2001
		Reveg Backfilled Pit	4,200	2004
	Fluro #1 Pit	Cover Tuff Disposal Cell	1,300	2008
		Reveg Backfilled Pit	800	2011
	Fluro Dump	Rip Dump Top	13,000	2008
		Reveg Dump	7,900	2011
	Fluro	Rip Roads	200	2009
		Reveg Roads	200	2012
	Mine Camp and Roads	Reveg Area	11,000	2037
		1988 Total	**$130,600**	

* Current Liability

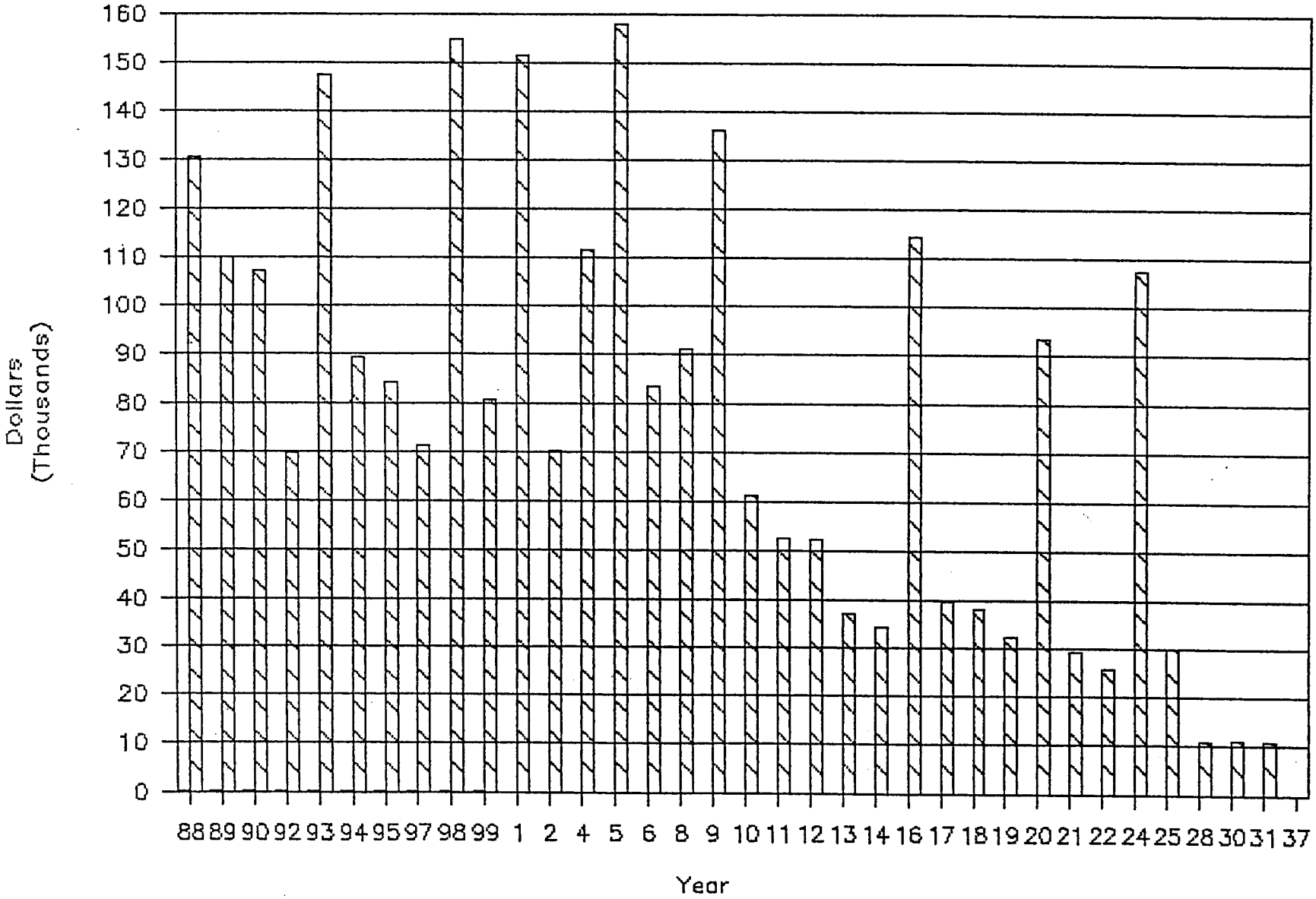
Year Incurred	Site	Task	Cost	Anticipated Year Of Release
1993	Monitor #1 Pit	Construct Pit Berm	200	1994
	Monitor Dump	Topsoil 1/3 Dump	66,800	1994
		Reveg 1/3 Dump	13,200	1997
		1993 Total	**$80,200**	
1994	Blue Chalk S #2 Pit	Construct Pit Berm	200	1995
	Blue Chalk N #1 & 2 Pit	Cover Tuff Disposal Cell	4,900	2017
		Reveg Backfilled Pit	3,700	2020
		1994 Total	**$8,800**	
1997	Rainbow #2 Pit	Construct Pit Berm	200	1998
		1997 Total	**$200**	
1998	Sec 16 S #1 Pit	Construct Pit Berm	100	2006
	Sec 16 N #1 & 2	Topsoil 1/3 Backfilled Pit	14,300	1999
		Reveg 1/3 Backfilled Pit	2,900	2002
	Sec 16 Dump	Topsoil 1/3 Dump	59,800	1999
		Reveg 1/3 Dump	11,400	2002
		1998 Total	**$88,500**	
2001	Monitor #2 Pit	Construct Pit Berm	100	2002
	Monitor Dump	Topsoil 1/3 Dump	66,800	2002
		Reveg 1/3 Dump	13,200	2005
		2001 Total	**$80,200**	
2004	Roadside/Fluro #4 Pit	Construct Pit Berm	100	2005
	Roadside I&II	Topsoil 1/2 Backfilled Pit	28,900	2005
		Reveg 1/2 Backfilled Pit	9,600	2008
	Roadside/Fluro Pit	Cover Tuff Disposal Cell	7,100	2008
		2004 Total	**$45,700**	
2005	Sec 16 N #1 & 2	Topsoil 1/3 Backfilled Pit	14,300	2006
		Reveg 1/3 Backfilled Pit	2,900	2009
	Sec 16 Dump	Topsoil 1/3 Dump	59,800	2006
		Reveg 1/3 Dump	11,400	2009
		2005 Total	**$88,400**	
2008	Fluro #2 Pit	Construct Pit Berm	100	2009
	Roadside I&II	Topsoil 1/2 BAckfilled Pit	28,900	2009
		Reveg 1/2 Backfilled Pit	9,600	2012
		2008 Total	**$38,600**	
2009	Sec 16 S #2 Pit	Construct Pit Berm	100	2010
	Sec 16 Dump	Topsoil 1/3 Dump	59,800	2010
		Reveg 1/3 Dump	11,400	2013
	Sec 16 N #1 & 2	Topsoil 1/3 Backfilled Pit	14,300	2010
		Reveg 1/3 Backfilled Pit	2,900	2013
		2009 Total	**$88,500**	

Year Incurred	Site	Task	Cost	Anticipated Year Of Release
2012	Rainbow #3 Pit	Construct Pit Berm	200	2013
	Rainbow Dump	Rip 1/2 Dump Top	5,800	2019
		Reveg 1/2 Dump	3,500	2022
		2012 Total	**$9,500**	
2013	Blue Chalk N #3 Pit	Construc Pit Berm	100	2014
		2013 Total	**$100**	
2016	Monitor #3 Pit	Construct Pit Berm	200	2017
	Monitor Dump	Topsoil 1/3 Dump	66,800	2017
		Reveg 1/3 Dump	13,200	2020
		2016 Total	**$80,200**	
2017	Blue Chalk S #3 Pit	Construct Pit Berm	200	2018
		2017 Total	**$200**	
2020	Camp #1 Pit	Construct Pit Berm	300	2021
	Camp Dump	Topsoil Dump	62,900	2021
		Reveg Dump	14,700	2024
		2020 Total	**$77,900**	
2024	Southwind #1 Pit	Construct Pit Berm	400	2025
	Southwind Dump	Topsoil Dump	72,300	2025
		Reveg Dump	18,900	2028
		2024 Total	**$91,600**	
2030	Sec 16 N #3	Construct Pit Berm	100	2031
		2030 Total	**$100**	

(1) Work Completed

CUMULATIVE RECLAMATION LIABILITY

1988 – 2037



Brush Wellman Topaz Mining Property
Reclamation Costs

Topsoil Placement

Material:	Topsoil	Job Efficiency:	0.62
Load Factor (%):	70	Equipment Cost ($/hr):	144.00
Equipment:	Cat 633D		
Capacity (LCY):	34		

	Area acres	Depth feet	Quantity CY	Haul Dist feet	Cycle Time min	Production cycles/hr	Product BCY/hr	Time hours	Adj Time hours	Cost $
Southwind Dump										
Ore Pad	9.80	3.00	47432	900	3.60	16.67	397	120	193	27773
Remainder of Dump Top	31.44	1.50	76085	900	3.60	16.67	397	192	309	44549
Dump Slopes	3.20	1.50	7744	900	3.60	16.67	397	20	31	4534
Camp Dump										
Ore Pad	7.60	3.00	36784	1000	3.70	16.22	386	95	154	22136
Remainder of Dump Top	24.37	1.50	58975	1000	3.70	16.22	386	153	246	35491
Dump Slopes	3.30	1.50	7986	1000	3.70	16.22	386	21	33	4806
Monitor Dump										
Ore Pad	20.60	3.00	99704	1600	4.45	13.48	321	311	501	72163
Remainder of Dump Top	65.98	1.50	159671	1600	4.45	13.48	321	498	803	115566
Dump Slopes	6.70	1.50	16214	1600	4.45	13.48	321	51	81	11735
Roadside I&II										
Cover Backfilled Pit	39.68	1.50	96025	1000	3.70	16.22	386	249	401	57787
Section 16										
Ore Pad	18.00	3.00	87120	2000	4.80	12.50	298	293	472	68014
Remainder of Dump Top	56.50	1.50	136730	2000	4.80	12.50	298	460	741	106745
Dump Slopes	2.20	1.50	5324	2000	4.80	12.50	298	18	29	4156
Cover Backfilled Pit	17.88	1.50	43270	3500	6.10	9.84	234	185	298	42929

Total Cost (1988 Dollars): 618385

Push Topsoil Over Dump Tops on to Slopes

Material:	Topsoil	Equipment:	Cat D8L
Density (lb/cy):	1600	Equipment Cost ($/hr):	125.00
Job Efficiency:	1.07		

	Quantity CY	Doze Dist feet	Max Prod CY/hr	Act Prod CY/hr	Act Time hours	Cost $
Southwind Dump	7744	50	1800	1926	4.02	503
Camp Dump	7986	50	1800	1926	4.15	518
Monitor Dump	16214	50	1800	1926	8.42	1052
Section 16 Dump	5324	50	1800	1926	2.76	346
				Total Cost (1988 Dollars):		2419

Cover Tuff Disposal Cells With Rhyolite

Material:	Rhyolite	Equipment:	Cat D8L
Density (lb/cy):	2550	Equipment Cost ($/hr):	125.00
Job Efficiency:	0.56		

	Area acres	Depth feet	Quantity CY	Doze Dist feet	Max Prod CY/hr	Act Production CY/hr	Act Time hours	Cost $
Roadside/Fluro Pit	5.95	3.00	28798	127	900	504	57.14	7142
Fluro #1 Pit	1.73	3.00	8373	69	1400	784	10.68	1335
Blue Chalk N #1&2 Pits	4.53	3.00	21925	111	1000	560	39.15	4894
Blue Chalk S #1 Pit	4.46	3.00	21586	110	1000	560	38.55	4818
Rainbow #1 Pit	5.23	3.00	25313	119	950	532	47.58	5948
						Total Cost (1988 Dollars):		24137

Construct Rock Safety Berms Around Pits

Material:	Rhyolite	Equipment:	Cat D8L
Density (lb/cy):	2550	Equipment Cost ($/hr):	125.00
Job Efficiency:	0.56		
X-sect. Area (SF)	24		
Doze Distance (Ft)	50		

	Length feet	Quantity CY	Max Production CY/hr	Actual Production CY/hr	Actual Time hours	Cost $
Taurus	1750	1556	1800	1008	1.54	193
Sigma Emma	5600	4978	1800	1008	4.94	617
Fluro #2	1240	1102	1800	1008	1.09	137
Roadside/Fluro #3	1240	1102	1800	1008	1.09	137
Roadside/Fluro #4	1240	1102	1800	1008	1.09	137
Rainbow #2	1650	1467	1800	1008	1.46	182
Rainbow #3	1650	1467	1800	1008	1.46	182
Blue Chalk, N #3	760	676	1800	1008	0.67	84
Blue Chalk S #2	2125	1889	1800	1008	1.87	234
Blue Chalk S #3	2125	1889	1800	1008	1.87	234
Sec. 16, S #1	905	804	1800	1008	0.80	100
Section 16 S #2	905	804	1800	1008	0.80	100
Section 16 N #3	910	809	1800	1008	0.80	100
Monitor #1	1900	1689	1800	1008	1.68	209
Monitor #2	1775	1578	1800	1008	1.57	196
Monitor #3	1775	1578	1800	1008	1.57	196
Camp #1	3050	2711	1800	1008	2.69	336
Southwind #1	3550	3156	1800	1008	3.13	391

Total Cost (1988 Dollars): 3764

Road Reclamation (Ripping, Waterbars and Regrading; does not include Revegetation)

Material: Compacted soil
Depth (feet): 2.00
Job Efficiency: 0.62
Assume 1 Waterbar/1000 Ft

Equipment: Cat D8H
Equipment Cost ($/hr): 127.00

	Length feet	Quantity CY	Max Production CY/hr	Actual Production CY/hr	Actual Time hours	Cost $
Taurus	1600	4148	1250	775	5.89	748
Sigma Emma	3000	7778	1250	775	11.04	1402
Roadside I & II	1500	3889	1250	775	5.52	701
Rainbow	6000	15556	1250	775	22.08	2804
Blue Chalk South	3000	7778	1250	775	11.04	1402
Fluro	500	1296	1250	775	1.84	234
					Total Cost (1988 Dollars):	7290

Rip Dump Tops

Material: Rhyolite & Tuff
Job Efficiency: 0.62
Depth (Ft) 1.00

Equipment: Cat D8H
Equipment Cost ($/hr): 127.00

	Area acres	Quantity CY	Max Production BCY/hr	Actual Production CY/hr	Actual Time hours	Cost $
Sigma Emma Dump	13.28	21421	1650	1023	20.94	2659
Roadside I&II Dump	113.61	183253	1650	1023	179.13	22750
Rainbow Dump	58.03	93602	1650	1023	91.50	11620
Blue Chalk North Dump	24.45	39438	1650	1023	38.55	4896
Blue Chalk South Dump	48.37	78021	1650	1023	76.27	9686
Fluro Dump	64.90	104684	1650	1023	102.33	12996
Taurus Dump	33.32	53745	1650	1023	52.54	6672
					Total Cost (1988 Dollars):	71279

Dump Berms (Top and Perimeter)

Material:	Soil	Equipment:	Cat D8H & 16G
Depth:	3 feet	Equipment Cost D8H ($/hr):	127.00
Job Efficiency:	0.62	Equipment Cost 16G ($/hr):	135.00

	Length feet	Quantity BCY	Max Prod BCY/hr	Act Prod BCY/hr	Time hours	Cost $	16G Time hours	16G Cost $	Total Cost $
Roadside I&II	7596	6752	1750	1085	6.22	790	0.58	78	868
Sigma Emma	3126	2779	1750	1085	2.56	325	0.24	32	357

Total Cost (1988 Dollars): 1225

Revegetation Treatments

	Item	Cost ($/ac)
1	Scarify w/harrow	75
2	Seed cost	75
3	Seed Broadcassting	100
4	Fertilizer Cost	151
5	Fertilizer Broadcasting	30
6	Mulch Cost	100
7	Mulch Broadcasting	30
8	Back-dragging	50
9	Rabbitbrush Seed	21
10	Rabbitbrush Broadcasting	100

Revegetation Treatment I: Items 1 through 8
Total Cost ($/ac): 611

	Area acres	Cost $
Sigma Emma Dump Berm	0.57	348
Roadside I&II Dump Berm	1.40	855
Taurus Road	1.29	788
Sigma Emma Road	2.41	1473
Roadside I&II Road	1.21	739
Rainbow Road	4.82	2945
Blue Chalk South Road	1.61	984
Rainbow-Blue Chalk Road	0.80	489
Fluro Road	0.40	244
Mine Camps	18.00	10998

Total Cost (1988 Dollars): 19864

Revegetation Treatment II: Items 1 through 5, and 8
Total Cost ($/ac): 481

	Area acres	Cost $
Camp Dump	30.45	14646
Southwind Dump	39.28	18894
Monitor Dump	82.46	39663
Section 16 Dump	70.95	34127
Sec 16 N 1 & 2 Pit	17.88	8600
Roadside/Fluro Pit	39.68	19086
Total Cost (1988 Dollars):		135017

Revegetation Treatment III: Items 9 and 10
Total Cost ($/ac): 121

	Area acres	Cost $
Rainbow Dump	58.00	7018
Blue Chalk North Dump	24.40	2952
Blue Chalk South Dump	69.00	8349
Fluro Dump	64.90	7853
Taurus Dump	33.30	4029
Rainbow #1 Pit	34.90	4223
Fluro #1 Pit (partial)	6.90	835
Blue Chalk N #1 & #2 Pits	30.20	3654
Blue Chalk S #1 Pit	29.70	3594
Roadside I&II	39.68	4801
Total Cost (1988 Dollars):		47309